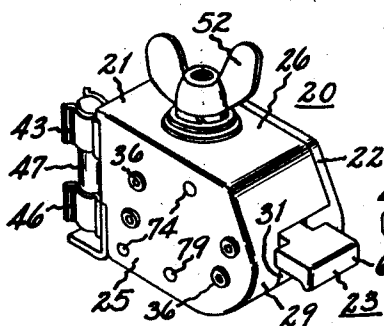
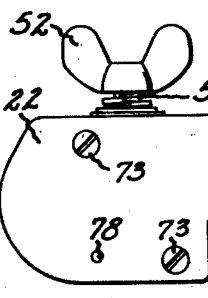
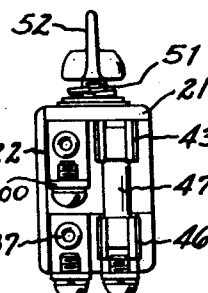
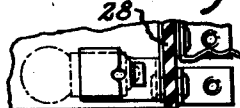
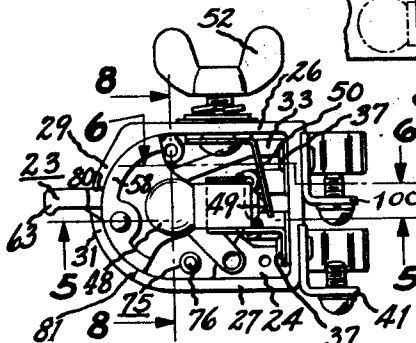
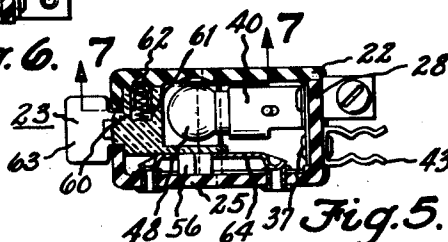
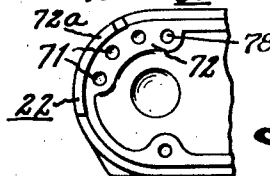
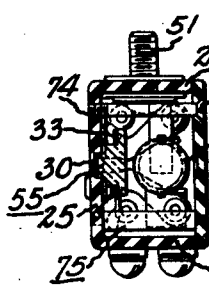
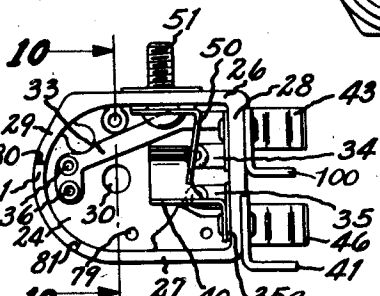
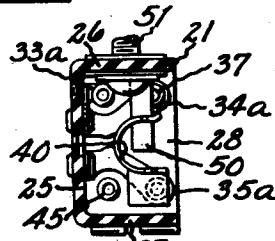
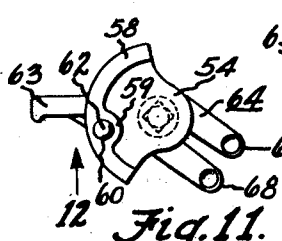
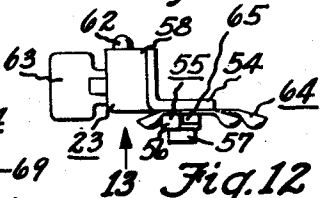
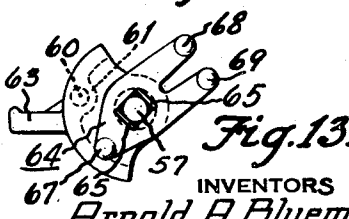


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ELECTRIC SWITCH

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ELECTRIC SWITCH

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20 Claims. (Cl. 200—167)

This invention relates to improvements in electric switches, and more particularly to switches adapted to be mounted on the dashboard of an automotive vehicle for controlling auxiliary current consuming devices. A telltale light is preferable for such switches so as to diminish the chances of inadvertently leaving the devices connected with the current source when the operator leaves the vehicle.

A general object of the invention is to provide a rotary type switch having three sub-assemblies which may be easily and conveniently assembled in a compact individual unit with the maximum economy of material and labor.

Another object of the present invention is to provide a translucent actuating member which can be supplied as a part of the switch. According to present invention, the switch housing is provided with an opening whereby rays of light from a lamp within the housing may illuminate the actuator, the actuator including a translucent apron to extend over the opening.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of the present invention is clearly shown.

In the drawing:

Fig. 1 is a perspective view of the switch embodying the present invention.

Fig. 2 is a side elevation of one side of the switch.

Fig. 3 is an end view of the switch looking in the direction of arrow 3 of Fig. 2.

Fig. 4 is a plan view of the casing member of the switch with the cover removed.

Fig. 5 is a sectional view of the switch taken on the line 5—5 of Fig. 4.

Fig. 6 is a detail sectional view taken on the line 6—6 of Fig. 4.

Fig. 7 is a detail view on line 7—7 of Fig. 5 illustrating the construction of the bottom side of the cover of the switch.

Fig. 8 is a sectional view of the switch taken on the line 8—8 of Fig. 4.

Fig. 9 is a plan view of the casing member of the switch.

Fig. 10 is a sectional view taken on the line 10—10 of Fig. 9.

Fig. 11 is a top plan view of the operating lever of the switch.

Fig. 12 is a side of the operating lever looking in the direction of arrow 12 in Fig. 11.

Fig. 13 is a bottom plan of the operating lever looking in the direction of arrow 13 of Fig. 12.

Referring to the drawing 20 designates a switch comprising a housing or casing member 21, a cover 22, and an actuating lever subassembly 23 located between stationary contact assembly and the cover assembly. The casing member 21 comprises a body of insulating material, preferably non-transparent, having a central chamber 24 to provide a bottom wall 25, side walls 26 and 27, a back wall 28 and an arcuate front wall 29. The front wall 29 is concentric with the axis of a recess 30 formed in the bottom wall 25. The front wall 29 is provided with a notch 31 which communicates with the chamber 24.

Stationary contact strips 33, 34 and 35 are secured at one end to the bottom wall 25 by rivets 36. The stationary contacts strips 33, 34 and 35 have integral projections 33a, 34a and 35a, respectively, which are bent at an angle for engagement with the back wall 28 and secured to the back wall 28 by rivets or eyelets 37. One of the rivets 37 is utilized to secure a U-shaped lamp socket 40 in electrical conducting relation with the projection 35a within the chamber 24 and also to secure a terminal member 41 on the outside of the back wall 28. Each element is provided with a suitable opening to receive the rivet 37. A second rivet 37 which passes through aligned apertures in the projection 33a and the back wall 28 secures a U-shaped spring clip 43 against the outside surface of the back wall. A rivet 45 secures a second U-shaped spring clip 46 on the outside of the back wall 28. The clips 43 and 46 are adapted to receive a fuse 47. The socket 40 supports a lamp 48 having a central terminal 49 for engagement with one end of a ground strap 50 of L-shaped formation. This strap 50 is secured to the side wall 26 by a bolt 51 which passes through aligned apertures in one leg of the strap 50 and the wall 26 of the case 21. The bolt cooperates with a wing nut 52 for securing the switch to a metal support (not shown) said metal support completing the ground connection for the lamps 48.

Referring to Figs. 11, 12 and 13, the actuating lever or driving assembly 23 is shown in detail. This actuating lever is preferably made of translucent insulating material and comprises a flat platform 54 adapted to be positioned below the lamp 48. This platform is provided with a hub or boss 55 on the lower side thereof. The hub is provided with flats 56 and a shaft portion 57. The shaft portion fits into the recess 30 which forms a bearing for the shaft portion 57. Formed integral with the platform 54 is an arcuate flange or apron 58 adapted to be disposed in front of

the lamp 48. The outer surface of flange 53 is concentric with the axis of the recess 30 and has a sliding fit with the inner surface of wall 29. The flange 58 has an enlarged portion 59 provided with a recess 60 in which is located a spring 61 for urging a ratchet cup or plunger 62 outwardly, see Fig. 5. A handle 63 is formed integral with the flange portion and is adapted to extend exteriorly of the casing 21 through the notch 31 in the wall 29.

The non-circular portion 56 of the hub supports a bridging member 64 which is best shown in Figs. 11, 12 and 13. The bridging member 64 is made of phosphor bronze or other resilient conducting material and has three arms 67, 68 and 69 that are integrally formed therewith. These arms are bent out of the plane of the member 64. The arms constitute contact engaging members for engaging the stationary contact strips 33, 34 and 35. The central portion of the bridging member 64 is provided with a non-circular opening. This opening is formed by striking metal out of the plane to provide normally deflected projections 65 so they will yieldingly bear against the flats 56 of the hub 55 when the bridging member is assembled to the actuator to be driven thereby. By this construction of the bridging member the arms 67, 68 and 69 are always under tension and in a downward direction as viewed in Figs. 5 and 12.

A cover 22 or closure of insulating material, preferably non-transparent, for closing the chamber 24 is provided on its inner surface with a plurality of recesses 71 arranged in a circular row on a flat surface 72 and a flange 72a which registers with the notch 31. The recesses 71 cooperate with the spring pressed plunger 62 to maintain yieldingly the actuating lever 23 in its various positions. The cover is secured to the casing 21 by screws 73 having screw threaded engagement with tapped holes 74 in the bottom wall 25 of the casing. When the cover 22 is secured to the housing 23, the flat surface 72 of the cover 22 will engage the upper edge of the apron 58 to urge the actuator toward the bottom wall and place the arms under greater tension to maintain yieldingly the arms in engagement with the bottom wall.

A removable pin 75 is suitably supported within the chamber between the cover and the bottom wall of the chamber. This pin is provided at each end thereof with reduced portions 76 which fit into aligned opening 78 and 79, of the cover and bottom wall, respectively. The pin is located in the circular path of movement of the flange 58 and acts as a stop to limit the rotation of the lever 23 in a counterclockwise direction, as viewed from Fig. 4. The movement of the actuating lever is limited in the clockwise direction by a shoulder 80 formed by the notch 31. Thus when the lever is actuated from its normal circuit open position, as viewed in Fig. 4, in a counterclockwise direction until the end of the flange 58 strikes the pin 75 the movable contact bosses 67, 68 and 69 will be moved into engagement with the stationary contacts 33, 35 and 34 respectively to close a circuit to a current consuming device which is electrically connected to a terminal member 100 on the back wall 28. The terminal 100 is electrically connected with the arm 34 through one of the rivets 37, see Fig. 10. A circuit to the lamp 48 will also be closed. The circuit completed will be as follows; current will flow from a current source through a lead not shown, to the clip 46, fuse 47 clip 43, stationary contact

strip 33 arm 67, and then divided; a portion of the current will pass through the arm to stationary contact 34, 34a, bracket 100 and thence to the current consuming device and back to the source through a ground connection not shown; another portion of the current will flow from the arm 67 through arm 69 stationary contact strip 35, 35a, socket 40 through lamp filament of lamp 48, contact 49 bracket 50, bolt 51 and back to the current source through the ground connections. Since the flange 58 in front of the lamp 48 is translucent, rays of light pass therethrough to indicate that circuit to the current consuming device is closed.

The present switch can be used for controlling other current consuming devices, for example, a fractional horse power motor, such as is employed for driving the fans of hot water type heaters for automobiles. In such cases it is desired to have two "on" positions for the switch, one "on" position for high speeds and the other "on" position for low speeds of the motor. This particular arrangement is made possible by removing the pin 75 from the chamber 24, thus permitting the lever 23 to move in a greater arc so that the bosses 68 and 69 will engage strips 34 and 33. In this instance a resistance coil (not shown) is preferably used. One end of the resistance coil is connected to the terminal member 100 and the other end to the terminal member 41 outside of the housing. If desired the lamp 48, socket 49 and bracket 50 could be removed, because the lamp would burn only in the first "on" position. Assuming that the pin 75, lamp 48, socket 40 and the bracket 50 were removed and the actuator is moved to its first "on" position the resistance coil will be shorted or out of the circuit causing the motor to operate at higher speeds. The circuit completed would be as follows: current would flow from the source to the clip 46, then through fuse 47, clip 43, stationary strip 34a, 34, movable contact arms 67, 68 strip 35, 35a, terminal 41 thence through the motor and back to the source through the ground connection provided by the motor. When the switch is moved to the second "on" position the resistance coil will be included in the circuit causing the fan motor to operate at low speeds. The circuit completed will be as follows: current will flow from the source to the clip 46, fuse 47, clip 43, strip 33a, 33, movable arm 67, or arm 69, to arm 68, strip 34, 34a terminal member 100, resistance coil 101, terminal member 41, and thence through the motor and back to the source through the ground connection provided by the motor. In this particular arrangement of the switch the movement of the lever in the counterclockwise direction will be limited by a shoulder 81 formed by the notch 31.

As illustrated in the drawing the switch structure includes the lamp socket 40 attached to the projection 35a of strap 35 and the L-shaped connector 50 supported by the bolt 51, obviously, the switch structure could be made with fewer parts, if desired, the parts 40 and 50 being dispensed with, the head of the rivet 37 in this case would engage the projection 35a.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. An electric switch comprising, a casing member of insulating material having a chamber and having a side opening in one of its walls com-

communicating with the chamber; a drive member of insulating material pivotally supported in the bottom of the chamber and having a translucent flanged portion extending over the side opening; a conducting member having contact bosses attached to the drive member; a plurality of stationary contacts located in the bottom of the chamber and arranged to coact with the respective contact bosses; a socket member fixed to one of the stationary contacts; a lamp supported within the socket; a ground connection for the lamp; a cover for the casing; means for rotating the drive member in one direction to close a circuit and causing the lamp to burn whereby rays of light will pass through the translucent flange portion; and stop means for limiting the rotation of the drive member to a limited arc.

2. An electric switch comprising, a casing member of insulating material having a chamber and having a side opening in one of its walls communicating with the chamber; a drive member of insulating material pivotally supported in the bottom of the chamber and having a translucent flanged portion extending over the side opening; a cup member yieldably supported on the flanged portion of the drive member; a conducting member having contact bosses attached to the drive member; a plurality of stationary contacts located in the bottom of the chamber and arranged to coact with the contact bosses; a socket fixed to one of the stationary contacts; a lamp supported in the socket; a ground connection for the lamp; a cover for the housing having a series of depressions and cooperating with the cup member to maintain yieldably the driving member in various positions; means for rotating the drive member in one direction to close a circuit and causing the lamp to burn whereby rays of light pass through the flange portion; and stop means for limiting the rotation of the drive member to a limited arc.

3. An electric switch comprising, a casing member of non-transparent insulating material having a chamber and having a side opening in one wall thereof communicating with the chamber; a drive member of non-conducting translucent material including an integral flat portion, said flat portion having a hub on the lower side thereof and journaled in a recess in the bottom of the chamber and having an apron on the upper side extending over the side opening; a conducting member within the chamber and attached to the hub portion, said conducting member having contact bosses; a plurality of stationary contacts located in the bottom of the chamber and arranged to coact with the respective contact bosses; a socket fixed to one of the stationary contacts; a lamp supported within the socket above the upper side of the flat portion of the driven member; a ground connection for the lamp; a non-transparent cover for the casing; means for actuating the drive member for giving the member a rotary motion in one direction to close a circuit and causing the lamp to burn whereby rays of light will pass through the flange portion of the drive member.

4. An electric switch comprising in combination; a receptacle having a chamber and having a side opening communicating therewith; a non-conducting driving member having a hub portion journaled in a recess in the bottom wall of the chamber; a conducting member driven by the drive member, within the chamber and attached to the hub portion, said member having contact arms bent toward the bottom of

the chamber; a plurality of stationary contacts located on the bottom of the chamber and arranged to coact with the respective arms of the conducting member, each stationary contact having a portion extending through a wall of the receptacle to the outside of the casing and arranged to be there connected to an exterior circuit connection; a yieldable ratchet cup carried by the driving member; a cover having a series of depressions and cooperating with the ratchet cup to maintain yieldingly the driving member in various positions; means outside the casing and extending through the side opening for giving the driving member a rotary motion in either direction; and means for holding the cover and receptacle together and for holding the contact arms in resilient engagement with the bottom wall of the chamber.

5. An electric switch comprising a casing member of non-transparent insulating material having a chamber and having a side opening communicating therewith; a non-conducting translucent driving member having a hub on one side thereof journaled in a recess in the bottom wall of the chamber and carrying a light emitting flange portion on the other side thereof extending over the side opening; a conducting member within the chamber driven by the drive member, said conducting member having a plurality of contact arms bent out of the normal plane of the conducting member; a plurality of stationary contacts located on the bottom of the chamber and arranged to coact with the respective contact arms, each stationary contact having an end fixed to another wall of the chamber; a socket secured to one of the stationary contact ends; a lamp supported within the socket; an L-shaped resilient member supported by a third wall of the chamber and adapted to be engaged by a terminal of the lamp; a non-transparent cover for the casing member; and means connected to the flange portion of the driving member and extending exteriorly of the casing through the opening for giving said drive member a rotary motion in one direction to close a circuit and causing the lamp to burn whereby the rays of light will pass through the flange portion of the driving member.

6. An electric switch comprising, a casing member of insulating material provided with a chamber and having a notch in one of its walls communicating with the chamber; a plurality of stationary contacts in the bottom of the chamber; a socket fixed to one of stationary contacts; a lamp in the socket; a rotatable member of insulating material pivoted in the bottom of the chamber and having a translucent flange portion extending over the notch and beyond the margins of the notch; a contact plate carried by the rotatable member and having contact bosses arranged to engage the stationary contacts; a closure for the casing; and means for actuating the rotatable member to bring the contact bosses into engagement with the stationary contacts to close a circuit and causing the lamp to burn whereby rays of light will pass through the translucent flange portion of the rotatable member.

7. In a device of the character described, comprising a cup-shaped housing having an opening in one of its walls; an electric switch within the housing; a lamp mounted within the housing and connectible to be lighted when the switch is in its "on" position; an actuator rotatably mounted on the bottom wall of the housing for

actuating the switch and including translucent apron disposed in the rear of the opening and in front of lamp whereby rays of light will illuminate the apron in front of the opening when the lamp is lighted and a cover cooperating with the apron for maintaining the pivotal relation between the actuator and the bottom wall of the housing.

8. In a device of the character described, comprising a cup-shaped housing having an opening in one of its side walls; an electric switch within the housing; a lamp mounted within the housing and connectible to be lighted when the switch is in its "on" position; an actuator pivotally mounted on the bottom wall of the housing for actuating the switch; an apron mounted on the actuator and adapted to cover the opening, said apron having a translucent portion adapted to be illuminated from the rear by light rays when the lamp is lighted; and a cover for the housing cooperating with the apron for maintaining the pivotal relation between the actuator and the bottom wall of the housing.

9. In a device of the character described, comprising, a cup-shaped housing of non-transparent material having an opening in one of its walls; an electric switch within the housing; a lamp mounted within the housing and connectible to be lighted when the switch is in its "on" position; a rotatable member pivotally supported on the bottom wall of the housing for actuating the switch, said rotatable member including a translucent flange adapted to extend over the opening in the "on" position of the switch whereby rays of light will pass through the flange when the lamp is lighted; and handle means projecting from the rotatable member and through the opening for controlling the rotatable member; and a cover of non-transparent material for closing the housing and for holding the actuator in its pivotal relation with the bottom wall of the housing.

10. A movable contact assembly for an electric switch comprising the combination of a rotor having a hub provided with flat portions and a shaft portion; and a conducting member having a central area and having a plurality of spaced arms extending therefrom the extremities of which form contact bosses, the central portion of the area being struck-out to form an opening and to provide a pair of spaced resilient tongues angularly disposed with respect to the normal plane of the central area of the conducting member, said opening receiving the hub and said tongues being adapted to engage yieldingly the flat portions of the hub to prevent rotation of the conducting member relative to the rotor and to hold the conducting member and the rotor in assembled relation.

11. A movable contact assembly for an electric switch comprising the combination of a rotor having a hub provided with flat portions and a shaft portion; a bridging member carried by the rotor, said member including a central area and a plurality of spaced arms projecting therefrom with the extremities of the arms located out of the normal plane of the central area, the central portion of the area being pierced to provide a pair of oppositely disposed tongues, said tongues being angularly disposed with respect to the plane of the central areas forming an opening in the central portion to receive the hub, the space between the free ends of the tongues being less than the cross dimensions of the flat portion hub so that the metal of the bridging member

will be under tension when same is assembled to the hub causing the tongues to grip the flat portion of the hub and yieldingly maintain the bridging member and rotor in assembled relation.

12. A movable contact assembly for electrical apparatus comprising the combination of a body member supporting a projection; a removable contact member having a central area provided with an opening to receive the projection and having arms extending from the central area with the free ends thereof located out of the plane of the central area; and resilient fingers attached at one end to the central area of the contact member the free ends of the fingers extending toward each other beyond the plane of the central area, said fingers gripping surfaces of the projection to hold yieldingly the contact member thereon and prevent the contact member from rotating relative to said projection.

13. A movable contact assembly for electrical apparatus comprising the combination of a supporting member carrying a non-rounded boss; a removable contact member having a central area provided with an opening and having arms extending from the central area adapted for engagement with stationary contacts; and a plurality of resilient fingers attached to the contact member, said fingers extending through the opening and gripping the non-rounded boss to hold yieldingly the contact member to the boss and to prevent rotation of the contact member relative to the boss.

14. An electric switch comprising, a housing having a chamber and a through opening in one of its walls communicating with the chamber; a rotatable carrier pivotally supported on another wall of the chamber; a translucent member located within the chamber and movable with the carrier and adapted to extend over the opening when the carrier is rotated a predetermined distance in one direction of rotation; a bridging member having a plurality of contact portions supported on the carriers; a plurality of stationary contacts carried by the housing and arranged within the chamber to coact with the respective contact portions of the bridging member; a lamp adapted to produce light electrically connected to one of the stationary contacts and rearward of the translucent member; a ground connection for the lamp; a closure for the housing, said closure cooperating with translucent member to maintain the pivotal relation of the carrier; and means outside the housing and extending through the opening for rotating the carrier in one direction to close a circuit and causing the lamp to produce light whereby rays of light will pass through the translucent member.

15. A movable contact assembly for an electrical apparatus comprising the combination of a body member having a non-circular boss; a removable bridging member mounted on the boss and non-rotatable in respect thereto; and resilient means carried by the bridging member and engaging the boss, the force of the resilient means against the boss yieldingly holding the bridging member and the body member in assembled relation.

16. A movable contact assembly for an electrical apparatus comprising the combination of a body member having a non-circular boss projecting from one side thereof; a removable bridging member having an opening formed to receive the boss therein; and resilient fingers carried by the bridging member said fingers con-

verging below the opening to grip the boss when same is passed through the opening and forced between the free end of the fingers to hold yieldingly the body and bridging member in assembled relation.

17. A movable contact assembly for an electrical apparatus comprising the combination of a rotor member having a non-rounded boss projecting therefrom; a removable bridging member; and a plurality of converging resilient fingers carried by the bridging member, said fingers being placed under tension to hold yieldingly the body and bridging member in assembled relation when the boss is forced between the fingers.

18. A movable contact assembly for an electric switch comprising the combination of a carrier having a pivot member projecting from one side thereof; and a bridging member driven by the carrier, said bridging member including a central area and a plurality of spaced contact arms extending therefrom with portions of the arms located out of the normal plane of the central area the area also being pierced to provide converging tangs projecting from the normal plane of the central area, said tangs permitting the pivot portion to be forced therebetween and beyond the free ends of tangs with the tangs gripping surfaces of the pivot member and yieldingly retain the bridging member and the carrier in assembled relation.

19. A movable contact assembly for a circuit controller comprising the combination of a body of non-conducting material provided with an integral pivot projection; and a removable con-

ducting member rotatable with the body, said conducting member including a central area having spaced resilient arms extending radially from the central area with the extremities of the arms located out of the normal plane of the central area, the central area of the conducting member being pierced to provide an opening and also converging resilient fingers with the free ends thereof extending beyond the normal plane of the central area between which the projection is forced to urge the fingers outwardly, said fingers gripping the projection to hold yieldingly the conducting member to the projection and also to prevent the conducting member from rotating relative to the projection.

20. In a device of the character described comprising a housing and a closure for the housing to provide a chamber, one wall of the housing having a through opening communicating with the chamber; stationary contacts carried by the housing; a lamp within the chamber and connected with one of the stationary contacts; a rotor pivotally supported on another wall of the housing, a bridging member movable with the rotor; a light emitting member movable with the rotor and disposed in the rear of the opening and in front of the lamp whereby rays of light will illuminate the light emitting member in front of the opening when the lamp is connected in a circuit, said light emitting member cooperating with the closure for maintaining the pivotal relation between the rotor and the other wall of the housing.

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